

ABSTRACT OF THE DISCLOSURE

Image data processing and image rendering methods and systems whereby images are displayed on display devices having pixels with separately controllable pixel sub-components. Image data, such as data encoded in a three-channel signal, is passed through a low-pass filter to remove frequencies higher than a selected cutoff frequency, which obtain samples from the color components of the signal that map spatially different image regions to individual pixel sub-components.. It has been found that color aliasing effects can be significantly reduces at a cutoff frequency somewhat higher than the Nyquist frequency, while enhancing the spatial resolution of the image. The image data is then passed through sampling filters, A generalized set of filters includes nine filters, one for each combination of one color and one pixel sub-component. The filtering coefficients of the filters can be selected to optimize of approximate an optimization of an error metric, which represents the color and luminance errors perceived on the display device. In this manner, a desired balance between color accuracy and luminance accuracy can be obtained. The samples mapped to individual pixel sub-components are used to generate luminous intensity values for the displayed image.

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